

Customer No.: 31561
Application No.: 10/064,395
Docket No.: 8219-US-PA

In The Claims

Please amend claims as follows:

[c1]

1. (currently amended) A programmable memory controller, comprising:

a main memory controller for sending a request signal when ~~thesaid_said~~ programmable memory controller ~~needs-to-accessed~~ accesses data from a memory unit;

a command decoder for decoding ~~thesaid_said~~ request signal to produce a plurality of command signals;

a ~~cycleperiod~~ period setting device for decoding a control signal to produce a ~~cycleperiod~~ period setting signal, wherein ~~thesaid_said~~ control signal controls ~~[the]~~ a maintenance period of ~~thesaid_said~~ command signal;

a command-sequencing device for ordering and outputting ~~thesaid_said~~ command signals according to the command signals and ~~thesaid_said~~ ~~cycleperiod~~ period setting signals; and

a command signal output device for receiving ~~thesaid_said~~ ordered command signals and ~~thesaid_said~~ ~~cycleperiod~~ period setting signals, and controlling ~~thesaid_said~~ output of ordered command signals outputted to the memory during ~~thesaid_said~~ maintenance period, according to indications provided by ~~thesaid_said~~ ~~cycleperiod~~ period setting signals.

[c2]

2. (currently amended) The memory controller of claim 1, wherein ~~thesaid_said~~ memory is a synchronous dynamic random access memory (SDRAM).

[c3]

3. (currently amended) The memory controller of claim 1, wherein ~~thesaid_said~~ memory is a double data rate dynamic random access memory (DDR DRAM).

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[c4]

4. (currently amended) The memory controller of claim 1, wherein ~~thesaid said~~ maintenance period is set according to the travel distance of ~~thesaid said~~ command signal.

[c5]

5. (currently amended) The memory controller of claim 4, wherein ~~thesaid said~~ travel distance includes trace length between ~~thesaid said~~ control chipset of ~~thesaid said~~ memory controller and ~~thesaid said~~ memory slot pin of ~~thesaid said~~ memory.

[c6]

6. (currently amended) The memory controller of claim 4, wherein ~~thesaid said~~ maintenance period can be a first period or a second period, ~~such that the~~ wherein the first period ~~command signal is up for~~ represents as one clock cycle, if the ~~command signal has a first period and the~~ second period ~~command signal is up for two cycles if the command signal has a second period~~ represents as two clock cycles.

[c7]

7. (currently amended) The memory controller of claim 6, wherein ~~thesaid said~~ maintenance period is the first period if ~~thesaid said~~ travel distance is lower than a pre-defined distance and the second period and ~~thesaid said~~ maintenance period is the second period if ~~thesaid said~~ travel distance exceeds ~~thesaid said~~ pre-defined distance.

[c8]

8. (currently amended) The memory controller of claim 7, wherein ~~thesaid said~~ pre-defined distance is about 2500 mils.

[c9]

9. (currently amended) A memory access structure having a programmable memory controller therein, wherein ~~thesaid said~~ memory access structure controls a plurality of command signals for accessing data inside a memory unit, comprising:

a control chipset having a built-in programmable memory controller, wherein ~~thesaid said~~ control chipset controls ~~thesaid a~~ maintenance period of ~~thesaid said~~ command signals output from ~~thesaid said~~ programmable memory controller when ~~thesaid said~~ control chipset needs to access data inside ~~thesaid said~~ memory unit; and

a memory slot for receiving ~~thesaid said~~ command signals and transferring ~~thesaid said~~ command signals to the memory unit, wherein ~~thesaid said~~ maintenance period of ~~thesaid said~~

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command signals is determined according to the control signals, ~~and the said maintenance period is set according to the distance between the said memory controller and the said memory slot.~~

[c10]

10. (currently amended) The memory access structure of claim 9, wherein ~~the said said~~ programmable memory controller further comprises:

a main memory controller for sending out a request signal when ~~the said said~~ control chipset needs to access data within ~~the said said~~ memory unit;

a command decoder for decoding ~~the said said~~ request signal and reading out ~~the said said~~ command signals;

a ~~cycle period period~~ setting device for producing a ~~cycle period period~~ setting signal according to the control signal, wherein ~~the said said~~ control signal controls the maintenance period of ~~the said said~~ command signal;

a command-sequencing device for ordering and producing new command signals according to incoming command signals and ~~the said said cycle period period~~ setting signals; and

a command signal output device for controlling ~~the said said~~ maintenance period of ~~the said said~~ ordered command signals going outputted to the memory slot according to indications provided by ~~the said said cycle period period~~ setting signals.

[c11]

11. (currently amended) The memory access structure of claim 9, wherein ~~the said said~~ memory is a synchronous dynamic random access memory (SDRAM).

[c12]

12. (currently amended) The memory access structure of claim 9, wherein ~~the said said~~ memory is a double data rate dynamic random access memory (DDR DRAM).

[c13]

13. (canceled)

[c14]

14. (currently amended) The memory access structure of claim 13, wherein ~~the said said~~ travel distance includes trace length between ~~the said said~~ control chipset and ~~the said said~~ memory slot pin position.

[c15]

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15. (currently amended) The memory access structure of claim 14, wherein ~~thesaid said~~ maintenance period can be a first period or a second period such that ~~thesaid said~~ command signal is up for one ~~cycleperiod period~~ if ~~thesaid said~~ command signal has a first period and ~~thesaid said~~ command signal is up for two cycles if ~~thesaid said~~ command signal has a second period.

[c16]

16. (cancelled)

[c17]

17. (currently amended) The memory access structure of claim 15, wherein ~~thesaid said~~ maintenance period is the first period if ~~thesaid said~~ travel distance is lower than a pre-defined distance and the second period and ~~thesaid said~~ maintenance period is the second period if ~~thesaid said~~ travel distance exceeds the pre-defined distance.

[c18]

18. (currently amended) The memory access structure of claim ~~16~~ 17, wherein ~~thesaid said~~ pre-defined distance is about 2500 mils.

[c19]

19. (currently amended) A motherboard having a memory unit and a memory controller thereon such that maintenance period for command signals traveling from ~~thesaid said~~ memory controller to the memory unit is determined by their distance of separation, ~~thesaid said~~ motherboard comprising:

a memory slot for receiving command signals and sending ~~thesaid said~~ command signals to the memory plugged into ~~thesaid said~~ memory slot, wherein ~~thesaid said~~ maintenance period of ~~thesaid said~~ command signal is set according to a control signal, and ~~thesaid said~~ maintenance period is related to the distance of separation between ~~thesaid said~~ memory controller and ~~thesaid said~~ memory slot;

a memory controller, comprising:

a main memory controller for sending a request signal when ~~thesaid said~~ programmable memory controller needs to access data from a memory unit;

a command decoder for decoding ~~thesaid said~~ request signal to produce a plurality of command signals;

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a ~~cycleperiod period~~ setting device for decoding a control signal to produce a ~~cycleperiod period~~ setting signal, wherein ~~thesaid said~~ control signal controls ~~thesaid said~~ maintenance period of ~~thesaid said~~ command signal;

a command-sequencing device for ordering and outputting ~~thesaid said~~ command signals according to the command signals and ~~thesaid said~~~~cycleperiod period~~ setting signals; and

a command signal output device for receiving ~~thesaid said~~ ordered command signals and ~~thesaid said~~~~cycleperiod period~~ setting signals, and controlling ~~thesaid said~~ ordered command signal outputted ~~of ordered command signal~~ to the memory during ~~thesaid said~~ maintenance period according to indications provided by ~~thesaid said~~~~cycleperiod period~~ setting signal.

[c20]

20. (currently amended) The motherboard of claim 19, wherein ~~thesaid said~~ memory is a synchronous dynamic random access memory (SDRAM).

[c21]

21. (currently amended) The motherboard of claim 19, wherein ~~thesaid said~~ memory is a double data rate dynamic random access memory (DDR DRAM).

[c22]

22. (cancelled)

[c23]

23. (currently amended) The motherboard of claim ~~23~~ 19, wherein ~~thesaid said~~ travel distance includes trace length between ~~thesaid said~~ control chipset of ~~thesaid said~~ memory controller and ~~thesaid said~~ memory slot pin position.

[c24]

24. (currently amended) The motherboard of claim ~~23~~ 19, wherein ~~thesaid said~~ maintenance period can be a first period or a second period, wherein ~~such that~~ the first period represents as ~~command signal is up for one clock cycle if the command signal has a first period~~, and the second period ~~command signal is up for~~ represents as two cycles ~~if the command signal has a second period represents as two clock cycle~~.

[c25]

25. (currently amended) The motherboard of claim 24, wherein ~~thesaid said~~ maintenance period is the first period if ~~thesaid said~~ travel distance is lower than a pre-defined distance and the

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second period and ~~thesaid said~~ maintenance period is the second period if ~~thesaid said~~ travel distance exceeds ~~thesaid said~~ pre-defined distance.

[c26]

26. (currently amended) The motherboard of claim 25, wherein ~~thesaid said~~ pre-defined distance is about 2500 mils.

[c27]

27. (currently amended) A method of controlling ~~the~~ a maintenance period of command signals according to travel distance between a memory unit and a memory controller, comprising the steps of:

generating a request signal when data inside ~~thesaid said~~ memory unit needs to be accessed;

decoding ~~thesaid said~~ request signal to produce a plurality of command signals, wherein ~~thesaid said~~ commands signals are sent to the memory unit to initiate data accessing operations;

decoding a control signal to produce a ~~cycleperiod period~~ setting signal, wherein ~~thesaid said~~ control signal controls ~~thesaid said~~ maintenance period of ~~thesaid said~~ command signal;

sequencing and outputting ~~thesaid said~~ sequenced command signals according to ~~thesaid said~~ input command signals and ~~thesaid said cycleperiod period~~ setting signals; and

controlling ~~thesaid said~~ sequenced command signal outputted ~~going~~ to the memory unit within ~~thesaid said~~ maintenance period according to indications provided by ~~thesaid said cycleperiod period~~ setting signals.

[c28]

28. (currently amended) The method of claim 27, wherein ~~thesaid said~~ memory is a synchronous dynamic random access memory (SDRAM).

[c29]

29. (currently amended) The method of claim 27, wherein ~~thesaid said~~ memory is a double data rate dynamic random access memory (DDR DRAM).

[c30]

30. (cancelled)

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[c31]

31. (currently amended) The method of claim ~~30~~ 27, wherein ~~thesaid said~~ travel distance includes trace length between ~~thesaid said~~ control chipset of ~~thesaid said~~ memory controller and ~~thesaid said~~ memory slot pin position.

[c32]

32. (currently amended) The method of claim ~~30~~ 27, wherein ~~thesaid said~~ maintenance period can be a first period or a second period, wherein ~~such that~~ the first period ~~command signal is up~~ represents as one clock cycle, ~~if the command signal has a first period~~ and the second period ~~the command~~ represents as ~~signal is up~~ for two clock cycles ~~if the command signal has a second period~~, and wherein the first period is shorter than the second period.

[c33]

33. (currently amended) The method of claim 32, wherein ~~thesaid said~~ maintenance period is the first period if ~~thesaid said~~ travel distance is lower than a pre-defined distance and the second period and ~~thesaid said~~ maintenance period is the second period if ~~thesaid said~~ travel distance exceeds ~~thesaid said~~ pre-defined distance.

[c34]

34. (currently amended) The method of claim ~~33~~ 31, wherein ~~thesaid said~~ pre-defined distance is about 2500 mils.